

Line Plot Lab

Graph linear equations from equations, descriptions, and tables.

GRADE 8 • MA.8.AR.3.4

MA.8.AR.3.4 "Given a mathematical or real-world context, graph a two-variable linear equation from a written description, a table or an equation in slope-intercept form."

NAME _____

DATE _____

GRAPHING A LINEAR EQUATION

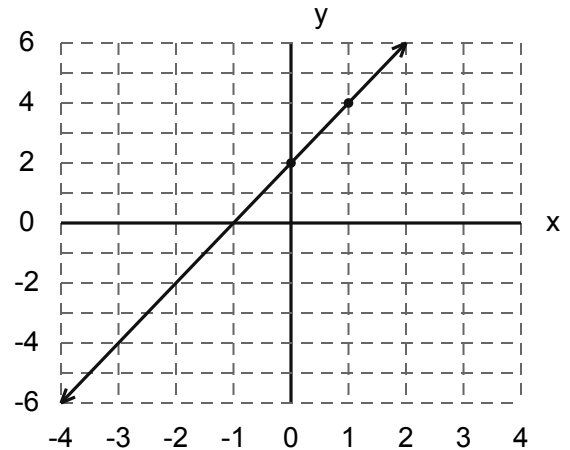
In $y = mx + b$, b tells where the line crosses the y -axis, and m tells the slope. Plot the y -intercept first, then use the slope to find another point. Draw a straight line through the points.

WORKED EXAMPLE

Graph $y = 2x + 2$. The completed graph shows two points and the line through them.

1. The y -intercept is 2: plot $(0,2)$.
2. Slope 2 means right 1 and up 2: plot $(1,4)$.
3. Draw the straight line through both points and extend it in both directions.

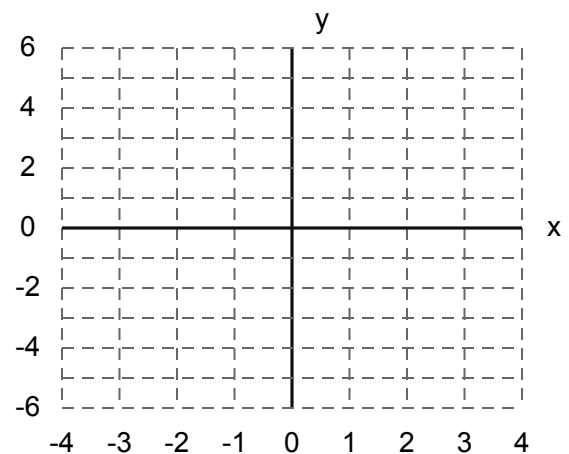
Answer: The line passes through $(0,2)$ and $(1,4)$.



PRACTICE 4 problems

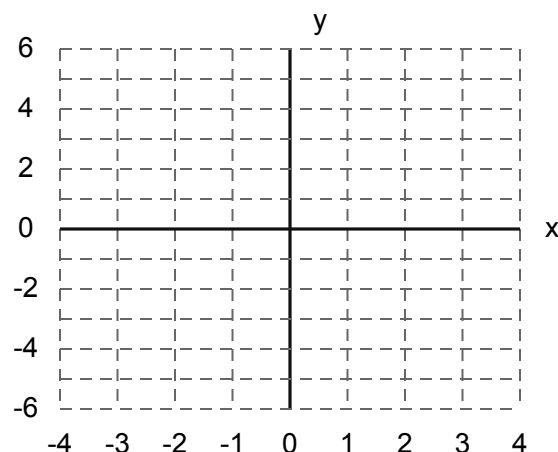
- 1** On one grid, graph A: $y = 2x - 3$ and B: $y = -x + 4$. Label both lines and list two points on each.

ANSWER _____



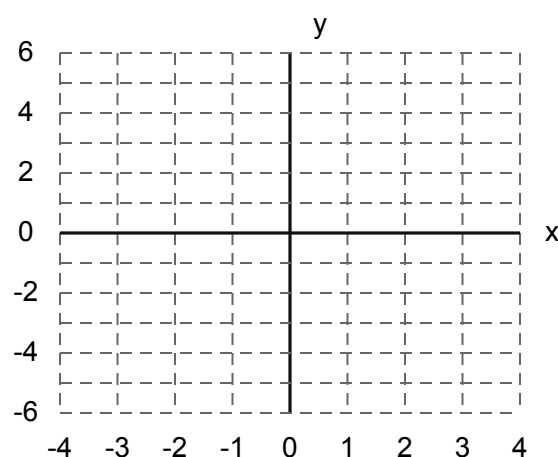
- 2** Graph $y = (1/2)x - 2$. List two points on the line.

ANSWER _____



- 3** A line crosses the y-axis at 1 and rises 3 units for every 1 unit to the right. Write its equation, then graph it.

ANSWER _____

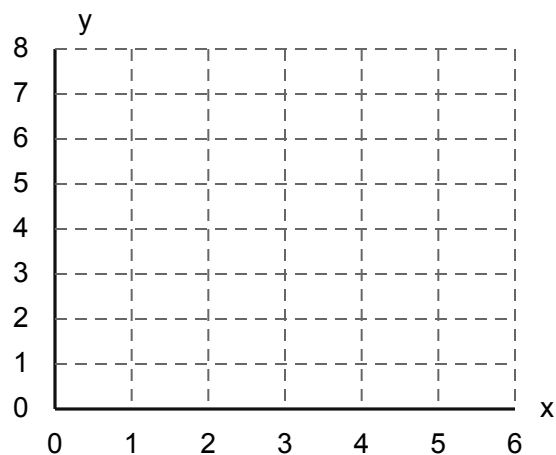


- 4** Use your completed graph from Practice 3. What is y when $x = -1$? Explain how that point agrees with the equation.

ANSWER _____

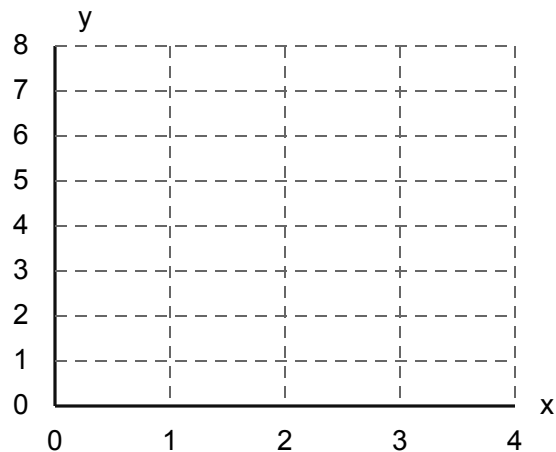
APPLY IT Show your work

- 1** A tank initially holds 2 liters. Water enters steadily at 1 liter per minute for 6 minutes. Let x be elapsed minutes and y be liters. Write the equation and graph the relationship only for $0 \leq x \leq 6$. Label the endpoints.



- 2** A sensor records a steadily warming liquid. The table shows time x (minutes) and temperature y (degrees Celsius). Write the equation and graph the model for $0 \leq x \leq 3$.

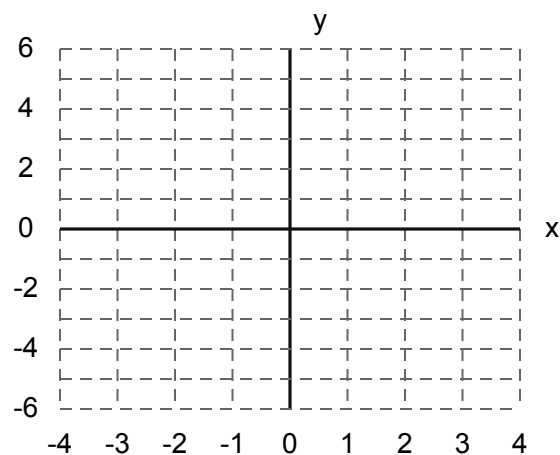
x (min)	0	1	2	3
y ($^{\circ}\text{C}$)	1	3	5	7



CHALLENGE One step up

A line passes through $(1, -2)$ and $(3, 4)$. Find its slope and y-intercept, write its equation, and graph the line. Explain how you found the intercept.

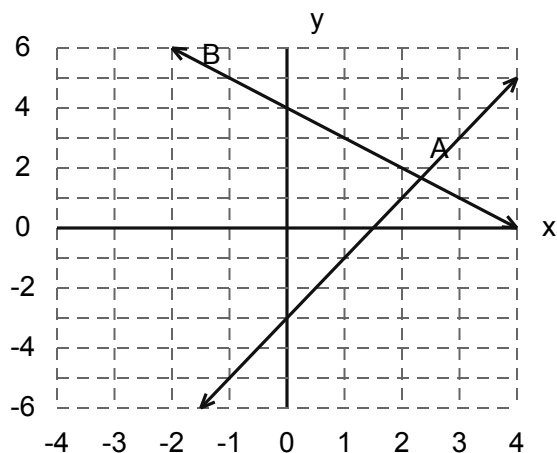
WORK SPACE AND ANSWER



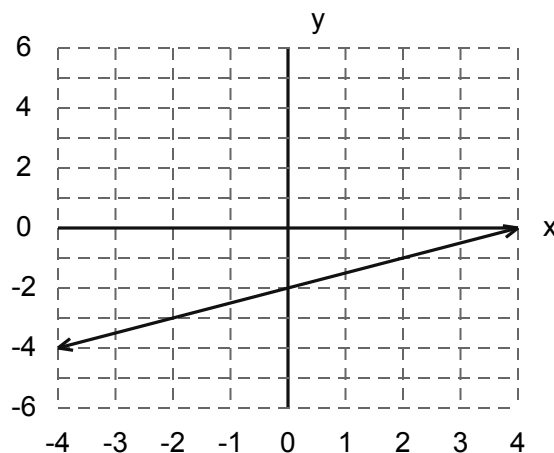
Accept any correctly plotted points on each line. Both axes use their printed numbers; label contextual variables and units in student answers. Equation and description tasks extend as lines with arrows. Context models are limited to the stated time intervals and use segments with included endpoints. The teacher graphs show those domains exactly.

PRACTICE 1

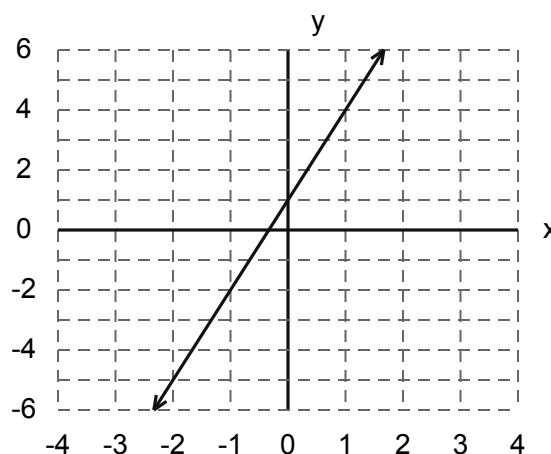
A: (0,-3), (1,-1). B: (0,4), (1,3).

**PRACTICE 2**

Examples: (0,-2), (2,-1).

**PRACTICE 3**

$y = 3x + 1$; points include (0,1) and (1,4).

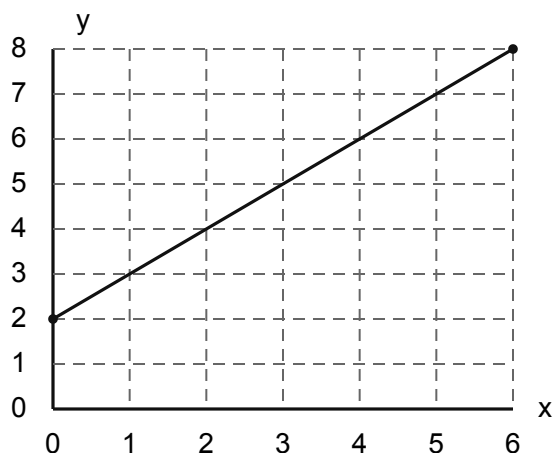
**PRACTICE 4**

$y = -2$; substituting gives $3(-1) + 1 = -2$, so the point is (-1,-2).

APPLY IT 1

$y = x + 2$ for $0 \leq x \leq 6$; segment from $(0,2)$ to $(6,8)$, both endpoints included.

The initial amount gives the intercept 2; the fill rate gives slope 1.

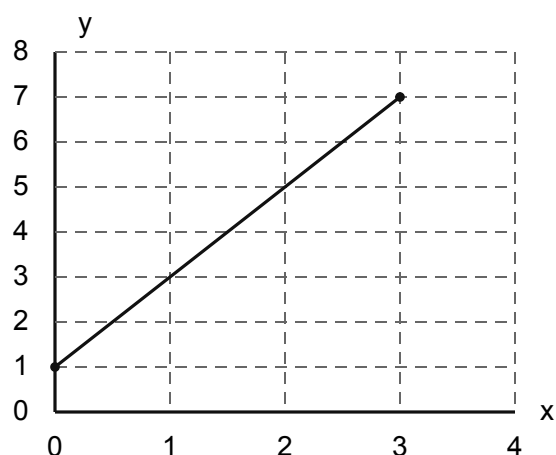


APPLY IT 2

$y = 2x + 1$ for $0 \leq x \leq 3$; segment from $(0,1)$ to $(3,7)$.

The rise is 2 degrees each minute; at time zero, the temperature is 1 degree.

x (min)	0	1	2	3
y (°C)	1	3	5	7



CHALLENGE

Slope $(4 - (-2))/(3 - 1) = 3$. Equation $y = 3x - 5$, so the y-intercept is -5 . Substitute $(1, -2)$: $-2 = 3 + b$.

